Voice Extreme Toolkit

When it comes to speech recognition products the California based company Sensory (*www.sensoryinc.com*) have been at the forefront for some time now. Their latest offering is the Voice Extreme™ speech recognition kit.

This kit contains a complete development environment allowing applications to be programmed using VE-C, a high-level language very similar to ANSI-C. As you would expect this language gives a great boost to programmer productivity compared with Assembler based software environments and allows the development of speech-controlled applications in a Windows environment. The resultant code is compiled and downloaded to the Voice Extreme module flash memory. The module can then be run in the development board or removed and plugged into the target system. The kit is distributed in the UK by:

Milford Instruments
Leeds. LS25 5AQ
Tel:01977 683665
www.milinst.com

The development kit contains a versatile hardware development card containing the speech module together with a software Integrated Development Environment (IDE) including an editor with source code debug and the Quick Synthesis™ program which allows any sound files with the .wav extension to be used in any of the Sensory RSC applications.

One board – many possibilities

The development kit hardware includes all the electronics, a microphone, speaker and sockets for connection to external equipment. An RS232 cable and mains adapter is also included. On the card there are five pushbuttons, one is for system reset another for program download/program starting while the remaining three, along with three status LEDs are free to be used by your application software.

A prototyping area is also available on the board to mount additional application specific hardware. All the I/O signals of the module are available along with the supply voltage rails. A connector is also included if you prefer to build the additional hardware on an external card.

The heart of the development kit is the Voice Extreme module. It includes

the RSC-300/364 microcontroller, crystal oscillator, firmware ROM and a 2 Mbyte flash memory to store your own application software. This module plugs into the development board (and eventually into your target application) via a 34 pin header. For production purposes the Voice Extreme module is available in a QFP package or in die form. In-circuit reprogramming is also supported.

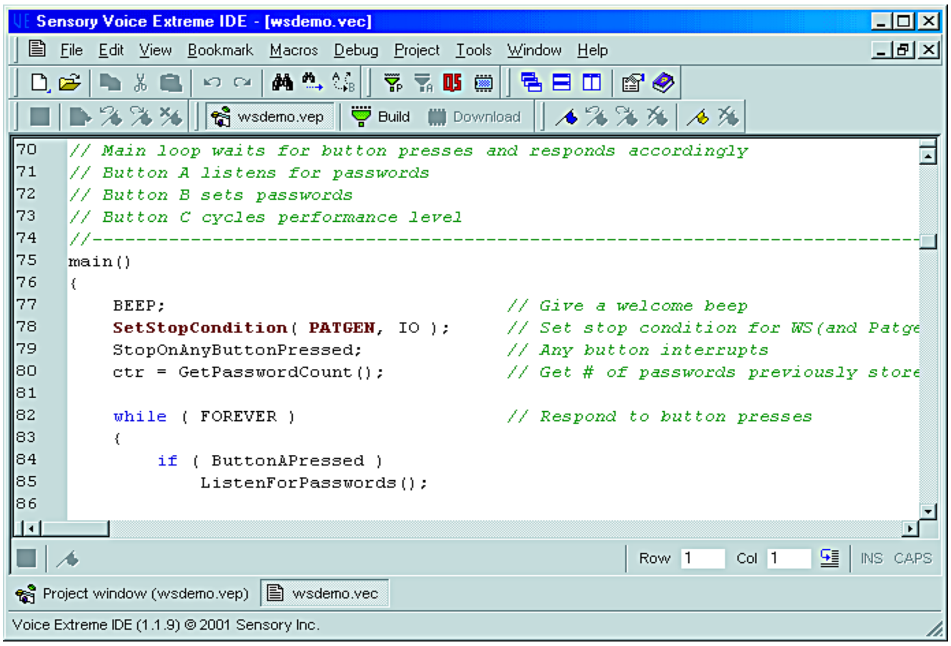
Software

The bundled software includes an Integrated Development Environment (IDE). This program suite contains all the tools necessary to write application specific software and includes a C editor, compiler, linker together with help functions and downloader. The editor supports C-Highlighting which improves program readability.

The IDE is supplied on a CD ROM together with the Quick Synthesis™ program that converts and compresses *.wav* files into a compatible file format used by the hardware. Also included on the CD are examples and extensive documentation.

In order to write speech recognition programs easily, it is of course necessary to make use of the library routines provided. Thanks to the numerous examples included on the CD together with the on-line help facility we found it a simple process to understand and make use of these library functions.

In the software documentation a distinction is made between ‘speaker independent’ and ‘speaker dependent’ speech recognition technology. In the first case the software will simply recognise a signal but in the second case it will recognise that signal only from a particular speaker. The difference between the two is a question of the accuracy with which the software evaluates the signal. The higher the accuracy then the more speaker specific the result will be. The software allows the recognition accuracy to be adjusted in steps. As well as the speech recognition routines are also software sound routines that can be used to generate synthetic music and allow you to play with samples and sound fragments.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Voice Extreme IDE (1.1.9) © 2001 Sensory Inc.

```
// Main loop waits for button presses and responds accordingly
// Button A listens for passwords
// Button B sets passwords
// Button C cycles performance level
//---------------------------------------------------------------------------
main()
{
    BEEP;                                   // Give a welcome beep
    SetStopCondition( PATGEN, IO );         // Set stop condition for WS(and Patge
    StopOnAnyButtonPressed;                 // Any button interrupts
    ctr = GetPasswordCount();               // Get # of passwords previously store

    while ( FOREVER )                       // Respond to button presses
    {
        if ( ButtonAPressed )
            ListenForPasswords();

```

In practice

All of the included example programs were tested in the *Elektor Electronics* laboratory. The speech recognition functioned outstandingly well despite the low quality microphone fitted to the card. The manufacturer suggests substituting a high quality microphone to further increase software recognition performance.

The examples demonstrate just some of the possibilities of this powerful tool. The accompanying source code gives you a good insight as to how the card can be used in many different situations and is an ideal starting point for you to begin writing your own applications.

In addition to the speech recognition examples there are also interesting music generation demos and compression of tone samples that work with the library supplied.

The kit is ideal for anyone interested in the field of speech recognition and especially if you already have an application in mind. All you need is a PC running Windows (95+) with 16 Mbytes RAM, 15 Mbytes free hard disk space, an unused RS232 port together with a little C programming experience and of course the purchase price of the kit £109+VAT.

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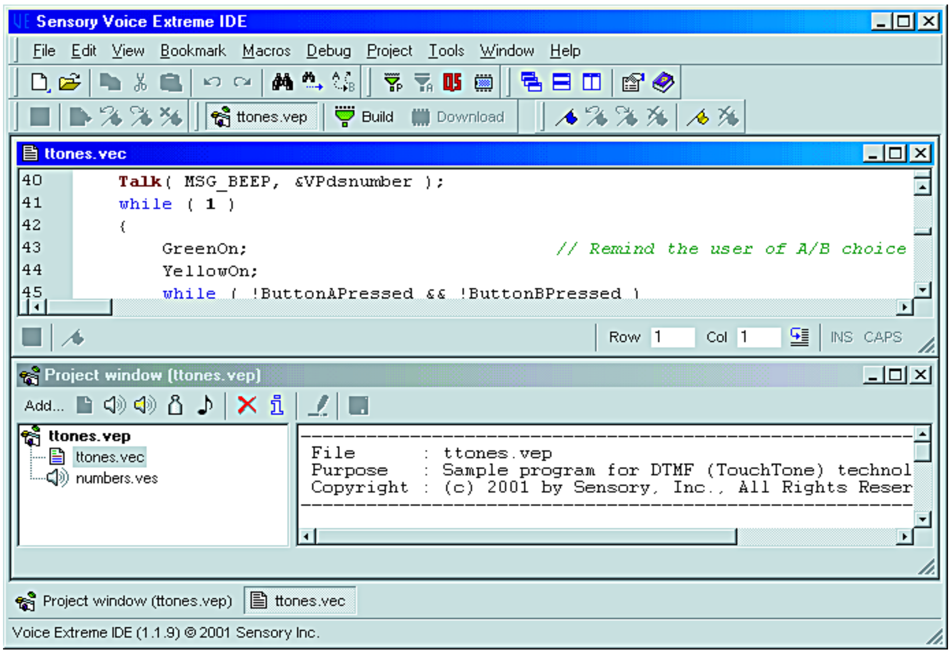
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Voice Extreme IDE (1.1.9) © 2001 Sensory Inc.

```
    Talk( MSG_BEEP, &VPdsnumber );
    while ( 1 )
    {
        GreenOn;                                    // Remind the user of A/B choice
        YellowOn;
        while ( !ButtonAPressed && !ButtonBPressed )
```

```
------------------------------------------------------------
File      : ttones.vep
Purpose   : Sample program for DTMF (TouchTone) technol
Copyright : (c) 2001 by Sensory, Inc., All Rights Reser
------------------------------------------------------------
```